

FIGURE 1: MmeI DNA CLEAVAGE

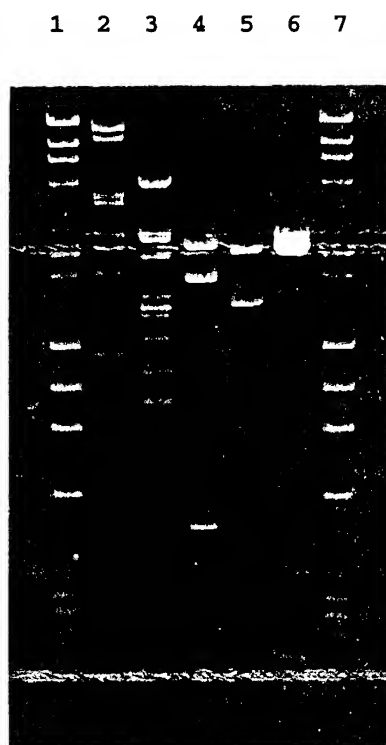


FIGURE 2: MmeI DNA SEQUENCE

1 GAATTCAGAG TAGGTAGTCC TTTGGTACTT CCATCCCAAC CAGTGTACAG  
51 TTCCGCGCCA AACCAATCGG TTAAAGTGTA AGAAAGTCTT GCACTGAAGT  
101 AGCTGTAGGA CAAACCGAAG TTAACCTCTG TGGTATCCCA GCGACCACCT  
151 TTAGGTGTTT GACGGAAGCC TGCTGCGTCA CCTGCCAAGT TATATTTCTT  
201 CCATGAACCA CCTGGGTACA GGTAGCTGAT CAAACCAGCA GTCCAACCCA  
251 AGCCTTCAAT AGCAGGAATA GTTCCGTAT ACCCACCATA AATATCAATT  
301 TCGGCAGTTG CATCAGGGAA GGTATTTGGT GTCACGTTTG AACCCCATGC  
351 ACCGACATAA AAGCCGCTGT CATGAGTAAT ATCAATACCG CCTTGAACGG  
401 CAGGTTTG TG CAGTTTGT GAAATACCAC GAGCATAGTA ATCTGAAACA  
451 AATCCAACGT TTGCAGTAGC AGCCCAGGCT GATTTTCTT CTTTAGCCTC  
501 TTCAGCTGCG TATGAAACTT GGGCAAAAGA TAATGTGCTT AACACTGCTG  
551 TGAGCAATAT AGATTGACGC ATTATGAGTC CTCTCTCTGT GAAATCTTTG  
601 ATTAAGTTGT TGTAACGAG AATGAAACAA CAACCACAAA GCAAAGCAGC  
651 TGCCAAACTA TAAATAACAT TATAATCAAT TATTTAAAAT ATATTTATAA  
701 TCTAAATAT TAAATTAATT ATTTAATAAA CTGTTTTTTA TTGATTAAAC  
751 TCTAAACAT ATGGGTGCAA CCACCCTTTT TACTCACTGA TAATGCTAAN  
801 ATAGCCAACA AAGGAGCCTT CACCATGCTG ATTTCAAATG AAAAAATTCA  
851 GGAATTATCT TAAAAATCA AACAATAAT CGAATCAAGC CCCATTTTCA  
901 AGCTAAATAA CAACTTGCAT GCACATAATC AGGGCGCACT CACCAAAATG  
951 GAACTTGTTT CGCGTGAAGA ATTCGATATC CAATCTGCAT TATTAGCGCG  
1001 CACGCAAGAG CAATTAAAC GTCTTGAAGA AAAAATCAGC CAGCTTGAAG  
1051 AAGGGCAGGC ATCCAGAAAG TAAAAATTAA TTTACAATTG TTAGCATTC  
1101 ATTATTGAGG AGTGCGTAT GAGTCTGCGG GTGTTTATCA GTCGCGGT

1151 AAGCGGCATG GAGGCGCCAG AAGTGGTGGT AGAAGTCCAC TTGGCGAATG  
 1201 GACTACCCAG CTTTACCATT GTTGAAACAT ATTGAAACTT TAAGCCTTAG  
 1251 CATT'TTTTCA AATATACAAA TGCCCAAGC TGGTGCATTA AGAAGAATGT  
 1301 AACAACTCCC TGCAGACTAG GAATAACTTC ATGATTTAAC GAACATCCCT  
 1351 GAGTTTCAAA GTCGAATCTT CTCGTGTTGC AAATTTCTAC AGCTTCCTTT  
 1401 CTGACCCTCT TGCACCAAAT TGCACATGCG CGCTAATAAA TCTTCGCTA  
 1451 TCCAATAATG TCCAACTAAC CCTTTATGGA CTCTTAAAAA AGATTTAATA  
 1501 AATGATTAAG ATGAATTCAA GGAATTTGAT GCCTGGAAAT ATGGCAAAAG  
 1551 CAAAAAGGCA GCCCAGTGCT GACTTTTTTG TTTTAACATT GGCCCATATA  
 1601 TCCAATTTC AATAATTTAA AAATTATCGG GAGCTAATCT GTGGCTTTAA  
 1651 GCTGGAACGA GATAAGAAGA AAAGCTATTG AGTTTTCTAA AAGATGGGAA  
 1701 GACGCCTCAG ATGAAAACAG TCAAGCCAAA CCCTTTTTAA TAGATTTTTT  
 1751 CGAAGTTTTT GGAATAACTA ATAAGAGAGT TGCAACATTT GAGCATGCTG  
 1801 TGAAAAAGTT CGCCAAGGCC CATAAGGAAC AATCTCGAGG ATTCGTAGAT  
 1851 TTGTTTGGC CTGGCATTCT TCTTATTGAA ATGAAAAGCA GAGGTAAAGA  
 1901 CCTCGACAAA GCGTATGACC AGGCACTTGA TTACTTTTCT GGCATTGCAG  
 1951 AAAGAGACTT ACCCAGATAC GTTTIAGTTT GCGACTTCCA GCGTTTCAGA  
 2001 TTAACAGACC TAATAACAAA AGAGTCAGTT GAATTTCTTT TAAAGGACTT  
 2051 ATACCAAAAT GTGAGGTCTT TTGGTTTAT AGCTGGTTAT CAACTCAAG  
 2101 TAATCAAGCC ACAAGACCCT ATTAATATTA AGGCGGCTGA ACGGATGGGT  
 2151 AAGCTTCATG ACACCCTGAA GTTGTTGGA TATGAGGGAC ACGCTTTAGA  
 2201 ACTTTATCTA GTGCGTTTAC TTTTGTGCTT ATTCGCAGAA GACACAATA  
 2251 TTTTGTAGAA AAGTTTATTC CAAGAATATA TCGAGACAAA GACGCTAGAG  
 2301 GACGGCAGTG ACCTTGACAA TCATATCAAT AACTTTTTT ATGTTCTCAA  
 2351 TACCCAGAAA CAAAAAGAT TAAAGAACTT AGACGAACAC CTTCCTCAT

2401 TTCCATATAT CAATGGAAAA CTTTTCGAGG AGCCACTTCC GCCAGCTCAG  
 2451 TTTGATAAAG CAATGAGAGA GGCATTGCTT GACTTGTGCT CATTAGATTG  
 2501 GAGCAGGATT TCACCAGCAA TATTTGGAAG TTTATTCCAA AGCATTATGG  
 2551 ATGCTAAAAA GAGAAGAAAT CTTGGGGCAC ACTACACCAG CGAAGCAAAT  
 2601 ATTCTCAAGT TAATCAAGCC ATTGTTTCTT GACGAGCTCT GGGTAGAGTT  
 2651 CGAGAAAGTT AAAAAATAATA AAAATAAATT ACTAGCGTTC CACAAAAAAC  
 2701 TAAGAGGACT TACATTTTTC GACCCTGCAAT GCGGTTGCGG AAATTTTCTT  
 2751 GTAATCACAT ACCGAGAAGT AAGACTTTTA GAAATTGAAG TGTTAAGAGG  
 2801 ATTGCATAGA GGTGGTCAAC AAGTTTGGGA TATTGAGCAT CTTATTCAGA  
 2851 TTAACGTAGA CCAGTTTTTTT GGTATCGAAA TAGAGGAGTT TCCCGCACAG  
 2901 ATTGCTCAGG TTGCTCTCTG GCTTACAGAC CACCAAATGA ATATGAAAT  
 2951 TTCAGATGAG TTTGGAAACT ACTTTGCCCG TATCCCACTA AAATCTACTC  
 3001 CTCACATTTT GAATGCTAAT GCTTTACAGA TTGATTGGAA CGATGTTTTA  
 3051 GAGGCTAAAA AATGTTGCTT CATATTAGGA AATCCTCCAT TTGTTGCTAA  
 3101 AAGTAAACAA ACACCGGGAC AAAAAGCGGA TTTACTATCT GTTTTGGAA  
 3151 ATCTTAAATC CGCTTCAGAC TTAGACCTAG TTGCTGCTTG GTATCCCAAA  
 3201 GCAGCACATT ACATTCAAAC AAATGCAAAC ATACGCTGTG CATTTGTCTC  
 3251 AACGAATAGT ATTACTCAAG GTGAGCAAGT ATCGTTGCTT TGGCCGCTTC  
 3301 TGCTCTCATT AGGCATAAAA ATAACTTTG CTCACAGAAC TTTCAGCTGG  
 3351 ACAAATGAGG CGTCAGGAGT AGCGGCGGTT CACTGCGTAA TTATCGGATT  
 3401 TGGGTTGAAG GATTGAGATG AAAAAATAAT CTATGAGTAT GAAAGTATTA  
 3451 ATGGAGAACC ATTAGCTATT AAGGCAAAAA ATATTAATCC ATATTTGAGA  
 3501 GACGGGGTGG ATGTGATTGC CTGCAAGCGT CAGCAGCCAA TCTCAAAATT  
 3551 ACCAAGCATG CGTTATGGCA ACAAACCAAC AGATGATGGA AATTCCTAT  
 3601 TTAATGAGG AGAAAAAAC CAATTTTATA CAATGAGG ATCTTCGGA

3651 AAATACTTCA GACGGTTTGT GGGCGGGGAT GAGTTCATAA ACAATACAAG  
 3701 TCGATGGTGT TTATGGCTTG ACGGTGCTGA CATTTTCAGAA ATACGAGCGA  
 3751 TGCCTTTGGT CTTGGCTAGG ATAAAAAAG TCCAAGAATT CAGATTAAAA  
 3801 AGCTCGGCCA AACCAACTCG ACAAAGTGCT TCGACACCAA TGAAGTTCTT  
 3851 TTATATATCT CAGCCGGATA CGGACTATCT GTTGATACCT GAAACATCAT  
 3901 CTGAAAACAG ACAATTTATT CCAATTGGTT TTGTTGATAG AAATGTCATT  
 3951 TCAAGTAACG CAACGTATCA TATTCCTAGT GCTGAACCTT TGATATTTGG  
 4001 CCTGCTTTCA TCGACCATGC ACAACTGCTG GATGAGAAAT GTAGGAGGAA  
 4051 GGTTAGAAAG TCGTTATAGA TATTCTGCCA GCCTGGTTTA CAACACGTTT  
 4101 CCATGGATTC AACCCAACGA AAAACAATCG AAAGCGATAG AAGAAGCTGC  
 4151 ATTTGCGATT TTAAAGCTA GAAGCAATTA TCCAACGAA AGTTTAGCTG  
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 4251 AAAC TTGATA AGGCTGTGGA TTCTGTCTAT GGATT TAAAG GACCAAACAC  
 4301 AGAAATTGCT CGAATAGCTT TTTTGT TGA AACATACCAA AAGATGACTT  
 4351 CACTCTTACC ACCAGAAAAA GAAATTAAGA AATCTAAGGG CAAAAATTAA  
 4401 TTAATGTATT TAACATTAAA CCACCCTGAT TTATTTTCGAA TAGTTCAAAT  
 4451 GCTTCCATGT GGACTAATCG CCTTCAATCA TATTAAAAAA CCGACGCTAG  
 4501 TAATAAAAAC TTCCAAAGAG GCCATATTAA CCGCCAAAAT TAATCGTGAA  
 4551 TTTAAATAT ATCTTTATCA AACCACATCG GCTTGTGTTC TAGTAAGTGC  
 4601 ATTTTTTGAC GATTCTGATA GTCCACTATT CATTACAACA CCAATTGTTC  
 4651 GAGATGACCA AACTCCTTA GACTTGTTAA GATTTTAAAT CAACAATGAT  
 4701 TTTACGATTT GCTTCTTTGA TGAAGTGAAC CGAGAATTTC TTTCCGTAA  
 4751 CGCAACTGGT AATTTAGTCT CTATCTTTGA GAGCATTAC TTGATGCCAC  
 4801 TGCCGAGCCC AGAGGAAGCC CACAATGCAT TGAATGAAGC GGAATTTTGG  
 4851 TTTAGTTTAC GCTCAGCTGC TGATGATGAA TCATCTATCC AGGTTTCTTT

4901 ATTGGATAAT CTATTTCTG ACGATTTTGT AATTTATGAC CTATCCTCAA  
 4951 AAAAAACGA TATGACATCA TTGGTTAGAG AAATAAACC AGGATACTAT  
 5001 CAGGAAGCAG ATATTGCAA GTTACTAACA AGAGCTTTTA GTTTGGAAAG  
 5051 CATTTATCAG AATCCAGTGA AAACAAGCGA TTCAAAGAG TTGGCAGACG  
 5101 TTGTGGTATT CGGCCAAAAG GAAATTTTAA TAATTCAAGC TAAAGATAGT  
 5151 GAAAACAATC AGAAACAAGT TTTAGAGGTT TCGTTAGACA AGAAATGCGC  
 5201 AAAGTCTTCA AAGAACTTT CTGAAGCTTT GGCACAACCT ACCGACACTA  
 5251 TCTTAACAAT ATCCAATACA CCAATAGTTG ATGTTCCGGT TGGTAAGAAA  
 5301 AAATGCACTC TGAACCTTGA GGGAAAGCAG CTTATTGGTA TCGTCGTTGT  
 5351 TAAAGAGCTT TTTAATGATA TTTACGATAA ATACAGTCAA AAAGTTTTTG  
 5401 AGCATGTAGA GTTGTCTAAA GCACCCATTG TCTTCTTTGA CTATCCAGAA  
 5451 TTTGCAAGAA TGACATTTCA TTGTAATTCT GAGGAATTAT TACTTTATGC  
 5501 TTTGCATAGG ATATTTAGTT CTGCAATAGA AAATGGAATG TATAAACGAT  
 5551 TGAGATTTAC TCAACCTATC ATAAGTATG GTCATGACAG CTACTTCAGG  
 5601 ATACAAAACA GGCCCCATTC TGATGAGGCC TATTTAATTT GCACAGAGGA  
 5651 TGAAATGAAG CTCTCAAATA AGTTTAAAGA CTAAATTTAT ATTTCCCTCA  
 5701 GTATCTTAAA AACAATATTC ATTAATTG AAAGCCCGCA ATGATTGTTG  
 5751 CAGTATCAAT GCGGGCATCA GTATCCAGCT CTTGCAATAC ACCGAAGTAT  
 5801 CAAGAAGCGA ATCAGGATTC TAACCATACC TTTTAAATTG CAACAATCTA  
 5851 ATTTCCATAA CATGTGTAGC TACATCGAAA AAAAGACCTC GAAGAGGTTG  
 5901 CAAGAGCGTC CAGCTCGCGG CATCAAAGA CCCTAGTCTT TTGACAAGGG  
 5951 GGAGCCAAAA AACTGAGGTG GAGGAGCTTG CCGACGAAGC CAGGAAGCCC  
 6001 CAGCGTCCGG

### FIGURE 3: MmeI AMINO ACID SEQUENCE

1 MALSWNEIRR KAIEFSKRWE DASDENSQAK PFLIDFFEVE GITNKR VATF  
51 EHAVKKFAKA HKEQSRGFVD LFWPGILLIE MKSRGKDL DK AYDQALDYFS  
101 GIAERDLPRY VLVCDFQRFR LTDLITKESV EFLKDL YQN VRSFGFIAGY  
151 QTQVIKQDP INIKAAERMG KLHDTLKL VG YEGHALELYL VRLLFCLFAE  
201 DTTIFEKSLF QEYIETKTLE DGSDLAHHIN TLFYVLNTPE QKRLKNLDEH  
251 LAAPFYINGK LFEEPLPPAQ FDKAMREALL DLCSLDWSRI SPAIFGSLFQ  
301 SIMDAKKRRN LGAHYTSEAN ILKLIKPLFL DELWVEFEKV KNNKNKLLAF  
351 HKKLRLGLTFF DPACGCGNFL VITYRELRL L EIEVLRGLHR GGQQVLDIEH  
401 LIQINVDQFF GIEIEEFPAQ IAQVALWLT D HQNMNKISDE FGNYFARIPL  
451 KSTPHILNAN ALQIDWNDVL EAKKCCFILG NPPFVGKSKQ TPGQKADLLS  
501 VFGNLKSASD LDLVAAWYPK AAHYIQTNAN IRCAFVSTNS ITQGEQVSL L  
551 WPLLLSLGIK INFARTFSW TNEASGVA AV HCVIIGFGLK DSDEKIIIEY  
601 ESINGEPLAI KAKNINPYLR DGVDVIACKR QQPISKLPSM RYGNKPTDDG  
651 NFLFTDEEKN QFITNEPSSE KYFRRFVGGD EFINNTSRWC LWLDGADISE  
701 IRAMPLVLAR IKKVQEFRLK SSAKPTRQSA STPMKFFYIS QPDTDYLLIP  
751 ETSSENRQFI PIGFVDRNVI SSNATYHIPS AEPLIFGLLS STMHNCWMRN  
801 VGGRLSRYR YSASLVYNTF PWIQPNEKQS KAIEEAAFAI LKARSNYPNE  
851 SLAGLYDPKT MPSELLKAHQ KLDKAVDSVY GFKGPNT EIA RIAFLFETYQ  
901 KMTSLLPPEK EIKKSKGKN\*

FIGURE 4: pTBMmeI.1 IS RESISTANT TO MmeI CLEAVAGE

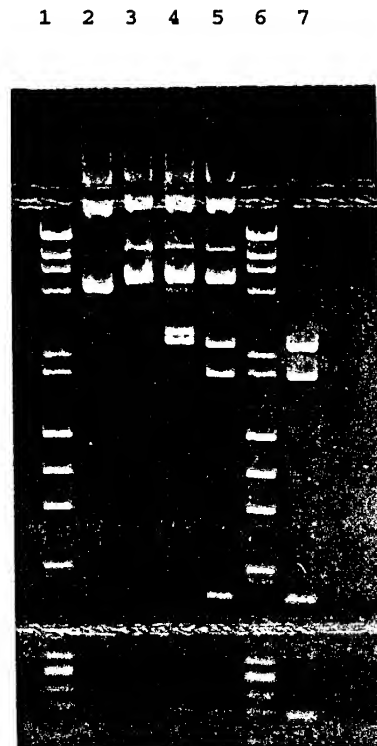
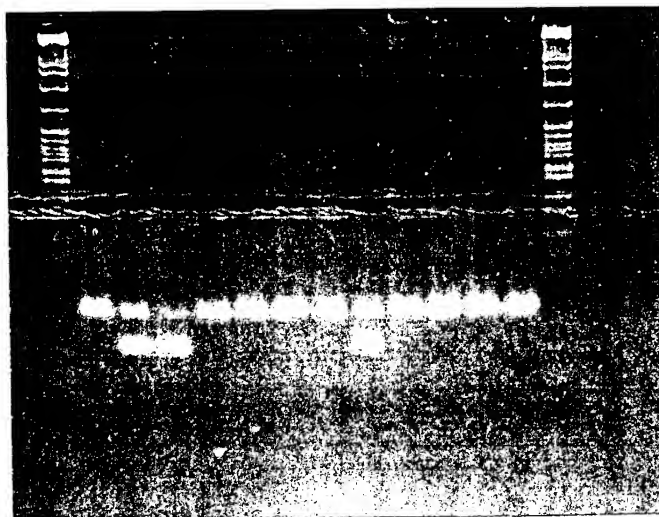




FIGURE 5: MmeI CLEAVAGE OF HEMI-METHYLATED SUBSTRATES

1 2 3 4 5 6 7 8 9 10 11 12 13 14



**FIGURE 6: METHYLATION INCORPORATION BY MmeI ENDONUCLEASE**

Top Strand:	/	Bottom strand:	<sup>3</sup> H-COUNTS
5'-TCCG <u>A</u> C-3'	/	5'-GTCG <u>G</u> A-3'	
unmethylated:	/	unmethylated	19,972
unmethylated:	/	methylated:	14,447
methylated:	/	unmethylated:	1,266
methylated:	/	methylated:	917

'A' indicates position of N6-methyl adenine in the DNA substrate

MmeI Figure 7: Multiple Sequence Alignment of MmeI and Homologous Polypeptides

FileUp of: @mme.list2

Symbol comparison table: GenRunData:\blosum62.cmp CompCheck: 1102

GapWeight: 6  
GapLengthWeight: 1

Name: mmelfeLORF3P = gi|28373198|ref|NP\_783835.1| (SEQ ID NO:3)  
Name: mmeLre121P = gi|23451826|gb|AAN32874.1|AF461726\_1 (SEQ ID NO:4)  
Name: mme = MmeI amino acid sequence (SEQ ID NO:5)  
Name: mmeNMA1791 = gi|15794682|ref|NP\_284504.1| (SEQ ID NO:6)  
Name: mmeBSU0677 = gi|16077744|ref|NP\_388558.1| (SEQ ID NO:7)  
Name: mmegcry = gi|9945797|gb|AAG03371.1| (SEQ ID NO:8)  
Name: mmePflQ8 = gi|23451826|gb|AAN32874.1|AF461726\_1 (SEQ ID NO:9)  
Name: saro3834 = gi|23110638|gb|ZP\_00096791.1| (SEQ ID NO:10)  
Name: mmeMSI135 = gi|20803963|emb|CAD31540.1| (SEQ ID NO:11)  
Name: mmeCC0826 = gi|16125079|ref|NP\_419643.1| (SEQ ID NO:12)  
Name: mmeDR0119.1 = gi|15807788|ref|NP\_285443.1| (SEQ ID NO:13)  
Name: mmeDR2267 = gi|15807258|ref|NP\_295988.1| (SEQ ID NO:14)

	1				50
mmelfeLORF3P	~~~~~	~~~~~MPT	RQQAAREFVK	TWS.SDKKGR	EDADRQTFWN
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	~~~~~	~~~~~MALSWNE	IRRKAIEFSK	RWE.DASD..	ENSQAKPFLI
mmeNMA1791	~~~~~	~~~~~MKTLQ	LQTAAQNFAA	YK.DQTD..	ERREKDTF*N
mmeBSU0677	~~~~~	~~~~~MALID	LEDKIAEIVN	R.E.DHSD..	.....FLY
mmegcry	MVMAPTTVFD	RATIRHNLTE	FKLRWLDRIK	QWEAENRPAT	ESSHDQQFWG
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	~~~~~	~~~~~MSLGAAGL	TPITPAAFIK	KWRKSELG..	ERQAAQEHFL
mmeCC0826	~~~~~	~~~~~	~~~~~MTPAQFVK	KWSDSQLR..	ERQASQEHFL
mmeDR0119.1	~~~~~	~~~~~	~~~~~MHPQEFAD	TWSRRALKAT	ERDSYVQHWL
mmeDR2267	~~~~~	~~~~~MPQTE	TAQRMEDFVA	YW..RTLKGD	EKGESQV.FL

	51				100
mmelfeLORF3P	DLLQRVYID	N.YYDYITYE	KDVQVKADGK	VTTRRIDGYI	P.STKIMVEM
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	DFFE.VFGIT	N.KR...VAT	FEHAVKKFAK	AHKEQSRGFV	DL...FWPGI
mmeNMA1791	EFFA.IFGID	R.KN...VAH	FEYPVKD..P	ADNTQ...FV	DI...FWEGI
mmeBSU0677	ELLG.VYDVP	R.AT...ITR	....LKK.GN	QNLTKRVGEV	HLKNKVV...
mmegcry	DLLDC.FGV	N.ARDLYLY.	....QRSK	RASTGRTGKI	DM...FMPGK
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~M
mmeMSI135	D.ICSLVGHP	SP.SDEDPTG	AFFAFEKGAN	KLG.GGKGFA	D.VWK..KGH
mmeCC0826	D.LCRMLEVP	TP.AEDDPLG	ERYCFERGAA	KTG.GGDGWA	D.VWR..KGC
mmeDR0119.1	D.LCQLLHHE	APGADPD...	..YKFERRVT	KVGTKDKGFA	D.VFK..KAH
mmeDR2267	DRLFQAFGH.	...AGYKEAG	AE..LEYRVA	KQG.GGKKFA	DLLWR..PRV

	101				150
mmelfeLORF3P	KGKNIKDSLK	PITQSGGD..	.....ELT	PFEQAKRYAN	FLPN...SEQ
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	LLIEMKSRGK	DL.....D..	.....KAY	D..QALDYFS	GIAERD...L
mmeNMA1791	FLAEHKSANK	NL.....T..	.....KAK	E..QAERYLQ	EIGRTKPSAL
mmeBSU0677	.FKKAK.KGK	LF.....D..	.....ALI	DIEQQVEYL.	.....CAK

mmegcry	VIIEAKSLGV	PLDDA.....	.....	.YAQALDYLL	G.GTIANSHM
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	NPVEIEEAVS	DLARAPYDAS	EFPPQFLAAF	GNKQTTLQRL	RAGNSNQSDL
mmeMSI135	FAWEYKRKKG	NLDEA.....	.....	.LLQLMRYAP	AL.....
mmeCC0826	FGWEYKGGKH	NLDAA.....	.....	.LRQLQAYAL	DL.....
mmeDR0119.1	FITEYKRPGS	DLGAA.....	.....	.LQQATLYSR	DL.....
mmeDR2267	LI.EMKKRGE	KLANH.....	.....	.YQQAFDYWL	KL.....

	151			200
mmelfeLORF3P	PR.....	WILVSNFNEI	DIHDM..E..	.RPLDEPKVI KL.....
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~
mme	PR.....	YVLVCDQRF	RLTDLITK..	.ESVE...F LL.....
mmeNMA1791	PE.....	YYAVSDFAHF	HLYRRVPE..	.EGAENQWQF PL.....
mmeBSU0677	PR.....	YLLVTDYDGV	LAKDTKTL..	.EALDVKF.. .....
mmegcry	PA.....	YVVCNPFETL	RVTRLNRTYV	GDSADWDITF PL.....
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	PGAVLQRNHI	HIATCDAGNV	DRTLAALRKS	PKTASQKARF ILATDGVAFQ
mmeMSI135	....L..SPP	LHIVCDIERL	RIHTAWTNTV	PSTY..VITL DDLAE.....
mmeCC0826	....Q..NPP	YLVVSDMERI	IVHTNWTNTI	SRKI..EFTL DDLHE.....
mmeDR0119.1	....G..NPP	LLLTSDFQRI	EINTAFTGTS	PKSY..LITL DDIAENRVVG
mmeDR2267	....VPDRPR	YAVLCNFDEL	.....WVYDF	NQQ.....L DEPMRLRI.

	201			250
mmelfeLORF3P	.EDLPKKVKS	L.....E	F....MVDA	NQQQVIDEKQ LSVDAGNLVA
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~
mme	.KDLYQNV.R	S.....	FGFIA...GY	QTQVIKQDP INIKAAERMG
mmeNMA1791	.EELPEYITR	G.....V	FDFMF...GI	EAKVRQIQEE ANIQAAATIG
mmeBSU0677	.EELPQY...	.....	FDFFLAWKGI	EKVEFEKENP ADIKAAERFA
mmegcry	.AEIDEHIEQ	L.....A	F....LADY	ETSAYREEEK ASLEASRLMV
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	AEDMASGETV	ACNYAAFPDK	FAFFLPLAGI	TTVQIRESS FDIKATGRLN
mmeMSI135	....PSAREM	LHNFFFSPEK	.....L	RPTR..TRAA VTKEAAdKFS
mmeCC0826	....PEKIAM	LRQVFDGSDS	.....L	KPKI..SPQE LTAKVAQRFG
mmeDR0119.1	GNDVP.ALQI	LHSALHQPYP	.....L	DPRL..FRER ITTDATRQVG
mmeDR2267	.EELPERYTV	LNFMFEQ..E	.....R	APLFGNNRVD VTREAADSA

	251			300
mmelfeLORF3P	KIYNELTNAY	AAGRGIDVN.	...EPRIQRS	LN..MLIVRL VFLLYADDSN
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~
mme	KLHDTL.K..	.....LVG.	....YE.GHA	LE..LYLVRL LFCLFAEDTT
mmeNMA1791	RLHDAL.K..	.....EEG.	...IYE.EHE	LR..LFITRL LFLFFADDSA
mmeBSU0677	RIYDVLRK..	.....ENN.	...IIETNRG	LD..LFLIRL LFCFFAEDTD
mmegcry	ELFRAMNGDD	VDEAVGDDAP	TTPEEEDERV	MRTSIYLTRI LFLFLGDDAG
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	KLYVELLKDN	PDWA.....	.....SRS	EDMNHFMARL IFCFFAEDTD
mmeMSI135	AIALRVQGR.	G.TPD.....	.....	.EIAHFVNQL VFCFFAQSVS
mmeCC0826	DLGRRQLQER.	GHHPR.....	.....	.DVAHFLNRV VFCMFAEDAK
mmeDR0119.1	LVARRLGERE	GRT.....	.....	.RAAHMMMRV VFALFAEDTG
mmeDR2267	KVLNSVIAR.	GEDRA.....	.....	.RAQRFLLC VMAMFAEDFE

	301			350
mmelfeLORF3P	LFGKEDIFQA	FIER...REP	RDIRRDLSEL	FKVLDQP.EE QRDPLYLDDF
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~
mme	IFEKS.LFQE	YIETKTLEDG	SDLAHHINTL	FYVLNTP.EQ KRLKNLDEHL
mmeNMA1791	VFRNRYLFQD	FLE..NCKEA	DTLGDKLNQL	FEFLNTP.DQ KRSKTQSEKF
mmeBSU0677	IFKRNS.FTN	LIKTLTEEDG	SNLNKLFADL	FIVL...DK NERDDVPSYL
mmegcry	LWDTPHLFAD	FVRNETTPE.	.SLGPQLNEL	FSVLNTA.PE KRPKRLPSTL
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~

saro3834	IFVGEGLFSR	TVETMSARDA	SDTHMVIAEI	FRAMDTRLAD	RAAAGIKSWA
mmeMSI135	LLPD.GLFTK	LLK.RSARAP	ERAMSYLDKL	FEAME.....	RGGEF...DL
mmeCC0826	LLPE.GLFTR	LTRSMQMRPP	AEAAPQFDAL	FAMMR.....	AGGMF...GA
mmeDR0119.1	MLER.GIVTR	LLE.RARAPP	GEDQLYFQDL	FGAMK.....	GGGEF...WG
mmeDR2267	LIPR.GFFTE	LADD.ARAGR	GSSFDFLFGGL	FRQMNTSERA	RGRF.....
	351				400
mmelfeLORF3P	NQFAYVNGGM	FSDENVIIPQ	FTDELKRLIV	EDAGRQFDWS	GISPTIFGAV
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	AAFPYINGKL	FEEPLPPA.Q	FDKAMREALL	.DLCS.LDWS	RISPAIFGSL
mmeNMA1791	KGFEYVNGGL	FKERLRTF.D	FTAKQHRALI	.DCGN.FDWR	NISPEIFGTL
mmeBSU0677	KEFPYVNGQL	FTEPHTEL.E	FSAKSRKLI	.ECGELNWA	KINPDIFGSM
mmegcry	AKFPYVNGAL	FAEPLAS.EY	FDYQMREALL	AAC..DFDWS	TIDVSFVGSL
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	DVFPYVNGQL	FSGS.TECPR	FSKIARSYLL	H..IGSLDWQ	KINPDIFGSM
mmeMSI135	TDITWFNGGL	FDGR..RALR	LDDGDEIGLL	.VAADGLEWG	LIDPTIFGTL
mmeCC0826	DIVHWFNGGL	FDEK..PALP	LERADIKLIH	DTAAEH.DWS	DLDPVSFVGNM
mmeDR0119.1	TDIRHFNGGL	FDSE..DALA	LTSEDAAAL	.IIAAKLDWS	EVEPSIFGTL
mmeDR2267	APIPYFNGGL	FRAV..DPIE	LNRDELYLLH	KAALEN.NWA	RIQPQIFGVL
	401				450
mmelfeLORF3P	FESTLN.PET	RRSGGMHYTS	IENIHKVIDP	LFLNDLHDEF	D.....
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	FQSIMD.AKK	RRNLGAHYTS	EANILKLIK	LFLDELWVEF	E.....
mmeNMA1791	FQSVMD.AQE	RREAGAHYTE	AANIDKVI	LFLENLRAEF	E.....
mmeBSU0677	IQAVAS.EES	RSYLGMYTS	VPNIMKVIK	LFLDKLNQSF	.....
mmegcry	FQLVKS.KEA	RRSDGEHYTS	KANIMKTIGP	LFLDELRAEA	D.....
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	IQAVAD.DEE	RGALGMHYTS	VPNILKVLNP	LFLDDLRAKL	E.....
mmeMSI135	FERFLD.PEK	RAQIGAHYTD	PEKIMRLVDP	VILRPLRQEW	EQARREIVEL
mmeCC0826	FEEALKATRE	RAALGAHYTD	REKILKIIDP	VITWPLMAQW	ETALAEIRAA
mmeDR0119.1	FENSLDV.DT	RSRRGAHYTS	VNDIERIVDR	VVMEPLWAEW	D.....
mmeDR2267	FQSSMDKKEQ	HAK.GAHYTS	EADIMRVVLP	TIVTPFQRQI	EAATTQ....
	451				500
mmelfeLORF3P	.....	.....	.....	.....	....KIQNMG
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	.....	.....	.....	.....	....KVK...
mmeNMA1791	.....	.....	.....	.....	....AVK..A
mmeBSU0677	.....	.....	.....	.....	....L
mmegcry	.....	.....	.....	.....	....KL..VS
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	.....	.....	.....	.....	....E.....
mmeMSI135	LNGN.....	.....	..RKPPMRR.	..QQSRR...	..MKREEAA
mmeCC0826	LDARAAAEAE	RKAVLEAAAE	AMRADPVKAK	AGEAARRKTL	TAIAKRSDAA
mmeDR0119.1	.....	.....	.....	....ALRLSL	PELKK.....
mmeDR2267	.....	.....	.....	.....	.....
	501				550
mmelfeLORF3P	NRRQRVTRAK	AFRDKLGKLK	FFDPACGSGN	FLTETYLSLR	KMENECLRII
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	...NNKNKLL	AFHKKLRLGT	FFDPACGCGN	FLVITYRELR	LLEIEVL.RG
mmeNMA1791	LKRDKAKKLA	AFYQKIQLQ	FLDPACGCGN	FLIVAYDRIR	ALEDDIIAEA
mmeBSU0677	DAYDDYTKLE	LLLTRIGKIK	FFDPACGSGN	FLIITYKELR	RMEINIIRKL
mmegcry	SPSTSVALE	RFRDSLSELV	FADMACGSGN	FLLLAYRELR	RIETDIIVAI
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	.AGDNSRKLL	NLRNRMAKIR	VFDPAACGSGN	FLVIAYKQMR	ELEAEI....
mmeMSI135	.AEVR.SR..	.FTERLRLKL	ILDPACGSGN	FLYLALQGVK	DIEHRANLDC
mmeCC0826	LOGAK.DADE	AFDRLRLKL	VLDPAACGSGN	FLVILALQGVK	DIEHRANLDC



mmeDR0119.1	..NVRLERLF	AFQDRLTAVR	ILDPACGSGN	FLFVALKKLL	DLEYQVRMAA
mmeDR2267	.....KELR	AILDELASFQ	VLDPACGSGN	FLYVAYRELR	RLEARALL..
	551				600
mmelfeLORF3P	VGNQGA..LA	LTDESEPKVK	IQNFYGIEIN	DFAVSVARTA	MWIAESQMWE
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	LHRGGQ..QV	LDIEHLIQIN	VDQFFGIEIE	EFPAQIAQVA	LWLTDHQNMN
mmeNMA1791	LKDKAD..GL	FD.SPSVQCR	LKQFHGIEID	EFAVLIARTA	MWLKNHQCNI
mmeBSU0677	QELLGE..YL	Y..VPSV..T	LSQFYGIEIE	DFAHDVAKLS	LWIAEHQMNE
mmePflQ8	RQRRGETGMS	LNIEWEQKLS	IGQFYGIELN	WWPAKIAETA	MFLVDHQANK
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	NRRRGEADRR	SD.....IP	LTNFRGIELR	NFPAEIRARL	LIIEAYQCDV
mmeCC0826	..EM..LG.M	PAQLP..LVG	PEILRGIEIN	MMAELARTT	IWIG.DIQWQ
mmeDR0119.1	..ER..LG.L	EVPTP..RVG	LACVRGIEIE	EYAAELARVT	LWIG.DLQWH
mmeDR2267	..VMNDIGEF	EMP.P..LVH	PQQMLGIEIE	TFAHELASIT	LWMG.YFQWK
	..RLRDLAP	GTALPPARVS	IRQMHGLEYD	PFGVELAKVT	LTLAKELAIR
	601				650
mmelfeLORF3P	QTKDI..TFA	NKDFLP.LDS	NDSIYEGNAL	RMDWNDI...	.....VKPY
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	KISDEFGNYF	A..RIP.LKS	TPHILNANAL	QIDWNDV...	.....LEAK
mmeNMA1791	RTQIRFDGEV	ACHTLP.LED	AAEIIHANSI	RTPW.....	.....QAA
mmeBSU0677	ELKNEVHNAV	R.PTLP.LHT	AGDIRCANAI	RVEWTEVCP.	.....AQGS
mmePflQ8	ELANAVGR..	PPERLP.IKI	TAHIVHGNAI	QLDWADILS.	.....ASAA
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	LYRGQ..KEA	LAEFLP.LDS	QNWITCGNAL	RLDWLSICPP	TGTAVKLQAN
mmeCC0826	IKNGIRS...	..KSIPILRK	LDAIERRDAL	VRQAQDVDTA	RDAQG.....
mmeDR0119.1	AKNNYRG...	..FAEPILSS	LDQIECRDAL	L.....	..NADG.....
mmeDR2267	RAHG.GH...	..WETPILQR	LDNIQNRDAL	L.....	..NPDG.....
	EMHDLGNTG	LDLFDQPL..P	LDNLD..DRI	V.....	..QG.....
	651				700
mmelfeLORF3P	EL.....	.....	DYIMGNPPFV	GYSLOTKEQK	QDIKQEFFKY
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	KC.....	.....	CFILGNPPFV	GKSKQTPGQK	ADL.LSVFGN
mmeNMA1791	D.....	.....	.YIFGNPPFI	GSTYQTKQK	NDL.ESICGH
mmeBSU0677	EE.....	.....	VYVFGNPPYL	GSKKQNKQK	SDM.LSIFGK
mmePflQ8	K.....	.....	TYIFGNPPFL	GHATRTAEQA	QELR.DLWG.
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	DLFEMPLDQA	EIDFENEGGE	TYICGNPPYL	GAKKKSSDQI	EDMKRV...G
mmeCC0826	DLAALQPVVS	EDAEAWEPEA	EFIVGNPPFV	GVRLMRQALG	DPTVDRLFDV
mmeDR0119.1	.....	..TEAQWPAV	DVIVGNPPFL	GSKRLRDGLG	NDYVERLFST
mmeDR2267	.....	..TEATWPRA	DFIVGNPPFL	GDKMMRSQLG	EAYTTQLRET
	DALF.....	....TPWPRV	DAIVGNPPFQ	SKNKLQREMG	AAYVKKLRAH
	701				750
mmelfeLORF3P	TDKY..GKFD	YVSGWYIKGA	KYIQ.NSTIK	VGFBVSTDSII	QGEQAPEIWK
mmeLre121P	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	LKSA..SDLD	LVAAWYPKAA	HYIQTANIR	CAFVSTNSIT	QGEQVSLWLP
mmeNMA1791	IKGY..GLLD	YVCNWWYKAA	GIMAQHPQVQ	TAFVSTNSIC	QGQQVEILWG
mmeBSU0677	VKNG..KMLD	YISAWFYFGA	KYAST.TNAK	VAFVSTNSVT	QGEQVSLWN
mmePflQ8	TKDI..SRLD	YVTGWHAKCL	DFFKSREG.R	FAFVTTNSIT	QGDQVPRLFG
saro3834	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	LDKA..QLLD	YVSFAFVRGL	PLVAQQ.RCD	MALVSTSSIC	QGEQVSLIWP
mmeCC0826	YDGRVSREAD	LVCYWVEKSR	AAVAADRTRR	VGLVTTNSIR	GGANRR.VLD
mmeDR0119.1	YRGKVPAAEAD	FVAYWIAKAW	ELVQAQQGRR	AGLVTTNSVR	GGASRK.VLD
mmeDR2267	FKDRLPGQSD	LVCYWPEKAR	ALIEAGVTTR	AGFVTTNSIR	GGKNRV.VLE
	YFD.VPGRAD	YCVYWIRKAI	D..QLGSCQR	AGLVGNTFIR	QNDSRVSGLD

	751		800
mmelfeLORF3P	VLFNDFHIFI	NYGYRSFEWN	NEAANKAKVD VVIVGFSTK. .EDKNPTIYD
mmeLre121P	~~~~~	~~~~~	~~~~~ ~VNKDILYN
mme	LLLS.LGIKI	NFAHRTFSWT	NEASGVAAVH CVIIGFGLKD ..SDEKIIYE
mmeNMA1791	SLLN.QGIEI	HFAHRTFQWT	SQAAGKAAVH CIIVGFRQKP PMPSEKTLYD
mmeBSU0677	ELFK.FGIQI	NFAYKSFKWA	NNAKNNAAVI VVIVGFG... PLDTKVNKYL
mmeGCry	PIFKA.GWRI	RFAHRTFAWD	SEAPGKAAVH CVIIVGFDKES ..QPRPRLWD
mmePflQ8	~~~~~	~~~~~	~~~~~
saro3834	RILKSAN..V	KFAYRPFRWS	NSAANNAGVY CTIIGLTGSE VSNKK.....
mmeMSI135	RIIA.ES.RL	FEAWSDEPWV	VDG...AAVR VSLICFGHG. .EDPLCL...
mmeCC0826	PIAD.AG.AL	MEAWADEPWA	LEG...AAVR VSMFGFGDG. .FAERRL...
mmeDR0119.1	RIKA.TG.DL	FMAWPDEPWQ	QNG...AAVR VSLFGFDNG. .TETLRT...
mmeDR2267	YVVQHGG.TI	TDAVGTQVWS	GD....AAVH VSIWNVWKGK AEGPKHLAWQ

	801		850
mmelfeLORF3P	EQKIIS....	..A.KHINQY	MYDSNIFID TTRKY.IEA. MPKMKTGNNRP
mmeLre121P	SSN*ISH...	..C.KNINGY	LFDGNINFV. TNRPAPLSN. VPRMHNGCKL
mme	YESINGEPLA	IKA.KNINPY	LRDGVVDIA. CKRQQPISK. LPSMRYGKPK
mmeNMA1791	YPDIKGEPEK	HAV.ANINPY	LIDAPDLII. AKRSRPIHC. EPDMVNGSKP
mmeBSU0677	FVD...ETKK	L.V.SNISPY	LTDGENILV. SSRTKPISD. LPKLHFGNMP
mmeGCry	YPDVKGEVVS	VEVGQSINAY	LVDGPNVLVD KSR.HPISSE ISPATFGNMA
mmePflQ8	~~~~~	~~~~~	~~~~~P.ADE RSQMDAGGKP
saro3834	...LFGEGSV	VEC.SSIAPY	LVPGPEI.IC APRQSSIS.G FARMV/MGNSP
mmeMSI135	..DGRT....	...VAQINAD	LTAGVTDLT ARRL.S..EN QNVAFMGDTK
mmeCC0826	..EGRK....	...AEHLHSD	FRGASTDVT ALRL.K..EN ASIAFMGDTK
mmeDR0119.1	LNDGH.....	...VGVINAD	LNAG.TDVKQ AQKL.P..EN AGVSFIGTQK
mmeDR2267	VGDHRTSPWQ	STELPVINSA	LSAG.TDVTQ AQKL.RVNMN SGACYQGQTH

	851		900
mmelfeLORF3P	ADGGALILSP	KEAKEL.VNE	EPQSKQ...F IKKLTGSKEF IT.GKYRYCL
mmeLre121P	LDGGFYTLTS	QERKEA.ISK	DPYADK...F IRPYLGAKNF IH.GTARYCI
mme	TDDGNFLFTD	EEKNQF.ITN	EPSSEK...Y FRRFVGGDEF IN.GTRWCL
mmeNMA1791	TEGGNLILST	AEKDAL.IAA	EPLAEQ...Y IRPFIGADEF LN.GKTRWCL
mmeBSU0677	NDGGGLLFTI	TEYTDA.INK	YPELVP...Y FKKFIGSVEF IN.GGLRYCL
mmeGCry	RDGGNLLVEV	DEYDEV.MS.	DPVAAK...Y VRPFRGSREL MN.GLDRWCL
mmePflQ8	VEGGNLLFAE	EEKQRL.VEG	NVDVVK...F LKRVYGASEY IR.GEVRFCL
saro3834	VDGKRLIFEQ	DEKESV.VAA	DPRSER...F FKRYGGTQEL VN.GVDRWCL
mmeMSI135	G.GAFDVPGS	LARAWLSMPM	NPNGRPNSDV LRPWRNGMDV ARR...PDM
mmeCC0826	G.GAFDVSGE	IAREWLRPL	NPNGRPNSDV LKPWRNAMDM TRRS...SDK
mmeDR0119.1	G.GAFDIPGD	LARSWLSVP.	NPDRVSNADV LKPWVNGMDL TRRP...SGR
mmeDR2267	GKKGFLLDGL	EAGQMLSAE.	....RKNAEV IFPYLTGDEL LRTSPHPHTR

	901		950
mmelfeLORF3P	WLVNVTTP...	.KQLR..SMP	L..VLKRVE. QCKENR.LSG APDRQKLAAT
mmeLre121P	WLKDANP...	.KDIH..QSP	F..ILDRIN. KVAEFRSQK SKDTQKYAKR
mme	WLDG.ADIS.	..EIR..AMP	L..VLARIK. KVQEFRLKSS AKPTRQSAST
mmeNMA1791	WFHGVSDVKR	NHDLK..QMP	Q..VQARIQ. AVKTMREASS DKQTQKDAAT
mmeBSU0677	WLNE....AK	YEKIK..SNP	L..IQERIS. ISKNHREKST DKGTNKLALT
mmeGCry	WLVDVAP...	.SDIA..QSP	V..LKKRLE. AVKSFRADSK AASTRKMAET
mmePflQ8	WISD....SQ	EQEAK..SNS	D..INCKLN. AVAAFRLLKSP KAATKKGAAW
saro3834	WIND....DQ	VDDAK..AIA	E..IAKVLE. SCRSYR.QGA GRDAQKAANR
mmeMSI135	WIVDFGWEMS	EQEAALEYAP	FQHIREHVFP .....ER SKN.....
mmeCC0826	WIIDFGWTMS	EADAALFETP	FRHVLHVHP .....ER DRN.....
mmeDR0119.1	WIIDFA.QMD	EGEARQYLQP	MAYVEQKIRP .....ER ATN.....
mmeDR2267	YVIDF.QPRD	VFGARAYKLP	FARIEREVLV TRQAAAAEEE ARNAEVLAAAN



mmelfeLORF3P	P.....	.....HL	.....FREQ	MNPDNYMIVP	LVTGCRRKYV
mmeLre121P	P.....	.....ML	PTRLAYYSHD	EHTD.MLIVP	ATSSQRREYL
mme	P.....	.....M.	..KFFYISQP	.DTDY.LLIP	ETSSSENRFI
mmeNMA1791	P.....	.....W.	..LFQKIRQP	SDGNY.LIIP	SVSSSESRRFI
mmeBSU0677	P.....	.....W.	..KFRDTHE.	.TTNYSIVVP	SVSSSENRFYI
mmegcryn	P.....	.....HL	FGQ....RSQ	PDTDY.LCLP	KVVSERRSYF
mmePflQ8	P.....	.....H.	..KFEEVKQI	GN.EVVTIVP	KVSSSEREYL
saro3834	P.....	.....HS	FC.YRTFQE.	...NIGIHVG	LTIGNGLSHV
mmeMSI135	....RRDAYR	...ERWWRHV	EPRPAFHASL	QGHSRYMATP	RV.AKHRTFV
mmeCC0826	....NREMYR	...LNWWKHV	EPRQGLMKRV	PALSRLLVTP	EV.SKHLRFI
mmeDR0119.1	....SDRPSR	...ERWWLHQ	RSRPELREAT	IELDRFIGIP	RV.AKHLLPV
mmeDR2267	PKAKTNKHHR	NFLNQWWALS	YGRSEMIEKI	SSLRYIVCS	RV.TKRQVFE
	1001				1050
mmelfeLORF3P	PFGYLG.NDI	IPTNLATIIP	EADHYAFGVL	ESIVHMAWMR	VVA...GRKG
mmeLre121P	PIGYVSEKNI	VSYSL.MLIP	NASNFNFGIL	ESKVHYIWLK	NFC...GRLK
mme	PIGFVDRNVI	SS.NATYHIP	SAEPLIFGLL	SSTMHNCWMR	NVG...GRLE
mmeNMA1791	PIGYLSFETV	VS.NLAFILP	NATLYHFGIL	SSTMHNAFMR	TVA...GRLK
mmeBSU0677	PMGLAGADTI	LS.NLIYVIY	DAEIYLLGIL	MSRMHMTWVK	AVA...GRLK
mmegcryn	TVQRYPSNVI	AS.DLVFHAQ	DPDGLMFALA	SSSMFITWQK	SIG...GRLK
mmePflQ8	PVGLLPRGSI	VT.DLAFALY	DAPLWNMALI	ASRLHLVWIG	~~~~~
saro3834	PAD.LKSSGF	VSSHTAYMIY	GWHPVEFALL	NSRLMLVWTE	TVG...GRLG
mmeMSI135	WLD....QAI	VPDSRIFAFS	RSDDVFFGIL	HSRFHEAWSF	GTCSSWHGV.G
mmeCC0826	WLD....ARV	LPDHLKQVVT	LDDDCSFGVL	HSRFHEVWAL	AAGSWHGS.G
mmeDR0119.1	WLP....EGT	LPDSQVVVIA	RDDDFIFGVL	ASTIHRSWAR	MQGTYMGV.G
mmeDR2267	FLD....NGI	RPSDGLQIFA	FEDDYSFGVI	QSSVHWQWLI	ARG...GTLT
	1051				1100
mmelfeLORF3P	TSYRYSKNLV	YTNFPWPV.V	DINQKEK...	.....ITI	TAQDILNARN
mmeLre121P	SDYRYSNTII	YNNFPWPT.V	GDKQEQN...	.....ISE	TAQGILNTRK
mme	SRYRYSASLV	YNTFPWIQ..	....PNEKQ.	....SKAIEE	AAFAILKARS
mmeNMA1791	SDYRYSNTVV	YNNFPFPE..	SCRLPSENDR	PDPLRAAVEA	AAQTVLDARG
mmeBSU0677	TDYRYSAGLC	YNTFPIPE.L	STRRKNE...	.....IEE	AILEILDLR.
mmegcryn	SDLRFANTLT	WNTFPVPE.L	DEKTRQR...	.....IIK	AGKKVLDARA
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	NGMRFSNTIV	YNTFPVPS.L	TDQNK.....	....ADLTR	CAEDILLARE
mmeMSI135	NDPTYNSAGV	FETFPFPEGL	TPDIPAVRYE	KDSRAIAISK	AAKRLDDIRN
mmeCC0826	NDPRYTISTT	FETFPFPEGL	TPNIAAVDYE	GDPRAQAIAA	AAAELNRLRE
mmeDR0119.1	NDLRYTPSTC	FETFPVP...	APT.....	.DEQRAEIEK	WAKYIVQLRE
mmeDR2267	ARLMYTSDTV	FDTFPWP*D.	.PTLAQVR..	.....AVAA	AAVKLRELNR
	1101				1150
mmelfeLORF3P	.....	.....LY.....	....PDSSLA	DLYDPLTMPI	
mmeLre121P	.....	.....LY.....	....PDSSLA	DLYDPLTMPV	
mme	.....	.....NY.....	....PNESLA	GLYDPKTMPS	
mmeNMA1791	.....	....QYRREAQ	EAGLPEPTLA	ELYAPDAGYT	
mmeBSU0677	.....	.....EE	QGG....TLA	ELYNPSTMPI	
mmegcryn	.....	....LH.....	....PERSLA	EHYNPLAMAP	
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	.....	....SHFP...	....ATIA	DLYDPETMPE	
mmeMSI135	AWLNPSDLVQ	IKPEVVPGYP	DRILPKDIAS	DAILRDRTLT	NLYNR.....
mmeCC0826	AWLNPPDLVR	IEPEVVPGYP	DRVLPVSPEA	GAELKKRTLT	NLYNQ.....
mmeDR0119.1	HLLN.....	.....Q	DA...KGTLT	GIYNQLEKLR	
mmeDR2267	KVMREQ....	.....GW.	.....SLR	DLYRTLDMPG	
	1151				1200
mmelfeLORF3P	E.....	.LRKAHEAND	KAVLKAYGLK	P.SATEPEI.	.VQHLFKMYE
mmeLre121P	E.....	.LRKAHEAND	KAVLKAYGLS	P.KATEQEI.	.VEHLFKMYE

mme	E.....	.LLKAHQKLD	KAVDSVYGFK	.GPNT..EIA	RIAFLFETYQ
mmeNMA1791	A.....	.LDKAHATLD	KAVDKAYGYK	TGKNTDDEAE	RVAFLFELYR
mmeBSU0677	E.....	.LKVAHEKLD	GIVERAYRQK	QFES..DE.E	RLEVLLKLYQ
mmegcry	E.....	.LIKAHDALD	REVDKAFGAP	RKLTTVRQ..	RQELLFANYE
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	S.....	.LRAAHDRND	EVLERIY...	IGRRFRNDTE	RLEKLFELYT
mmeMSI135	.....RP.Q	WLVDASHDL	AAVAGAYGWP	ADIS...EDE	ALANLLELNL
mmeCC0826	.....RP.A	WLDMAHQRLD	AAVAAAYGWP	DGLT...DDE	ILERLFALNQ
mmeDR0119.1	NSPDAAHPVS	ALATAHDKLD	QAVATAYGWE	WPLN...EDQ	VLERLLALNL
mmeDR2267	KNP.....	.LRDAQERLD	AAVSAAYGLP	AGA.....D	MLDFLLALNA

	1201				1250
mmelfeLORF3P	KLTKKDW~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeLre121P	KLTKGER*~~	~~~~~	~~~~~	~~~~~	~~~~~
mme	KMTSLLPPEK	EIKKSKGKN*	~~~~~	~~~~~	~~~~~
mmeNMA1791	KAAAIA~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeBSU0677	EMTER~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmegcry	KLISHQP~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmePflQ8	~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
saro3834	KMTGGRSSEG	GAA~~~~~	~~~~~	~~~~~	~~~~~
mmeMSI135	AREAFNEHAK	SGLKTRKPRR	RPTPEEVRR	PQMKLPIAGG	RKSVVGPQQL
mmeCC0826	ERAAAGR~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeDR0119.1	ERCPA~~~~~	~~~~~	~~~~~	~~~~~	~~~~~
mmeDR2267	XVAAAEARGA	AVTGPGLPAG	LNTADFVTAD	AVRPLG*~~~	~~~~~

	1251		1273
mmelfeLORF3P	~~~~~	~~~~~	~~~
mmeLre121P	~~~~~	~~~~~	~~~
mme	~~~~~	~~~~~	~~~
mmeNMA1791	~~~~~	~~~~~	~~~
mmeBSU0677	~~~~~	~~~~~	~~~
mmegcry	~~~~~	~~~~~	~~~
mmePflQ8	~~~~~	~~~~~	~~~
saro3834	~~~~~	~~~~~	~~~
mmeMSI135	TTKDRENQPT	SAERPRNTKR	RTS
mmeCC0826	~~~~~	~~~~~	~~~
mmeDR0119.1	~~~~~	~~~~~	~~~
mmeDR2267	~~~~~	~~~~~	~~~